Claims

[c1] A vessel system (207; 407) comprising:

a vessel (201; 401);

at least one internal wall (202; 402a; 402b; 402) located within the vessel (201; 401);

at least one inflatable seal (208; 308; 408), the inflatable seal allowing to create a seal between an outer periphery (302) of the internal wall and an internal cavity wall (310) of the vessel;

the vessel system being characterized in that it further comprises

a shaft (412) traversing longitudinally the vessel (201; 401), the shaft allowing to transmit a force applied on the at least one internal wall (202; 402a; 402b; 402) to an end of the vessel.

[c2] The vessel system of claim 1, wherein :

the at least one inflatable seal (208; 308; 408) is inserted within a peripheral groove (309) of the internal wall;

the at least one inflatable seal (208; 308; 408) allows to secure the internal wall (202; 402a; 402b; 402) inside the vessel (201; 401) when the inflatable seal is inflated, by creating a blocking seal between the outer periphery of the internal wall and the internal cavity wall; and

the at least one inflatable seal (208; 308; 408) allows to remove the internal wall (202; 402a; 402b; 402) from the vessel (201; 401) when the inflatable seal is deflated and a grip of the seal on the internal cavity is released.

[c3] The vessel system of claim 1 or 2, wherein the shaft (412) is hollow, the vessel system further comprising :

a duct (413) to supply an inflation medium to the at least one inflatable seal (208; 308; 408), the duct being located within the shaft (412).

[c4] The vessel system of claim 5, further comprising a programmable logic controller (416) to control a pressure of the inflation medium within the at least one inflatable seal (208; 308; 408).

[c5] The vessel system according to anyone of claims 1 to 4, further comprising a removable cap (205; 405) at an end of the vessel (201; 401), the removable cap allowing when removed to open the vessel over a full section.

[c6] The vessel system according to anyone of claims 1 to 5, wherein:

the shaft (412) comprises a plurality of individually detachable parts 423 which are sequentially removably mounted; the vessel system further comprising :

a plurality of internal walls (202; 402a; 402h; 402);

a plurality of connectors 421, each connector allowing to connect two individually detachable parts 423 at each inter-volume 424 between two internal walls (202; 402a; 402h; 402) so as to allow to individually remove the internal walls from the vessel (201; 401).

[c7] The vessel system according to any one of claims 1 to 6, wherein

a fluid is intended to flow through the vessel (201; 401);

the vessel system allows to separate a oily phase from an aqueous phase of the fluid;

the at least one internal wall (202; 402a; 402h; 402) supports a coalescing polymer (411).

[c8] The vessel system according to claim 7, wherein the coalescing polymer (411) allows oil droplets of the oily phase to coalesce to form large oil drops, the vessel system further comprising:

an oil output (417) to allow to recover the large oil drops after the at least one internal wall (202; 402a; 402h; 402).

[c9] A method for removably securing at least one internal wall (202; 402a; 402h; 402) within a vessel (201; 401), the method comprising:

inflating at least one inflatable seal (208; 308; 408) to create a seal between the at least one internal wall and an internal cavity wall (310) of the vessel;

attaching the at least one internal wall to a shaft (412), the shaft traversing longitudinally the vessel (401) and allowing to transmit a force applied on the at least one internal wall to an end of the vessel.

[c10] The method of claim 9, further comprising:

monitoring a pressure of a medium fluid of the at least one inflatable seal (208; 308; 408);

controlling the pressure of the medium fluid.

[c11] The method according to claim 9 or claim 10, further comprising:

deflating the at least one inflatable seal (208; 308; 408);

opening the vessel (201; 401) over a full section;

removing the at least one internal wall (202; 402a; 402b; 402) from the vessel by hoisting the shaft (412).

[c12] The method of claim 9 wherein :

a fluid is intended to flow through the vessel (201; 401);

the system allows to separate a oily phase from an aqueous phase of the fluid;

the at least one internal wall (202; 402a; 402b; 402) supports a coalescing polymer (411).

[c13] The method according to claim 12, wherein the coalescing polymer (411) allows oil droplets of the oily phase to coalesce to form large oil drops, the method further comprising:

recovering the large oil drops at an oil output (417) after the at least one internal wall (202; 402a; 402b; 402).

[c14] A method for dismantling a vessel system (207; 704), wherein the vessel system comprises a vessel (201; 401) and at least one internal wall (202; 402a; 402b; 402) located within the vessel, the method comprising:

deflating at least one inflatable seal (208; 308; 408), the at least one inflatable seal allowing to create a seal between the at least one internal wall and an internal cavity wall (310) of the vessel;

attaching the at least one internal wall to a shaft (412), the shaft traversing longitudinally the vessel (401) and allowing to transmit a force applied on the at least one internal wall to an end of the vessel.

[c15] The method according to claim 14, further comprising :

disposing the vessel (201; 401) in a vertical orientation;

opening the vessel over a full section by removing a removable cap (205; 405) at an end of the vessel;

removing the at least one internal wall (202; 402a; 402b; 402) from the vessel by hoisting the shaft (412).